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26 March 1963

MEMORANDUM FOR: Deputy Director/Research

SUBJECT : Basic Research Requirements

1. The following list of subjects can be identified among the current general problems being investigated by TSD/R&D as areas where improvements not presently possible would be desirable for operational reasons. This list is by no means exhaustive and from time to time may be extended in scope:

- (a) General research in the chemistry and physics of mixed gases--especially as related to the interface with solids. (Goal: Information which may point the way toward new types of sonic transducers).
- (b) General research in the chemistry and physics of the interaction of various kinds of electromagnetic energy with solid surfaces. (Goal: Efficient means of read-out of very broad band data recording).
- (c) Studies as in (b) but looking more at bulk phenomena and including the influence of trace contaminants

[REDACTED]
systems).

- (d) General physical and chemical studies in relation to the

- (e) Studies as in (c) above but specifically involving photo-

[REDACTED]
type of S/W system).

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- (f) Studies as in (c) and (e) above but specifically involving

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materials).

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- (g) Studies as in (c) above but involving especially irradiation with energy in the so-called radio frequency portion of the spectrum and with emphasis on the absorptive properties of materials. (Goal: More information about the possible existence of RF "windows" in various solids).

- (h)

[REDACTED]

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- (i) Studies as in (a) above but with particular attention given

[REDACTED]
collection systems).

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- (j) Mathematical studies of a fundamental sort in areas that might reasonably be expected to advance our knowledge of autocorrelation and optimization techniques. (Goal: Adaptive filters and pattern recognition machines which can work effectively with much less a priori information than is presently required).

- (k)

[REDACTED]

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2. The goals indicated in each case above are, of course, quite arbitrarily selected from the many specific instances which might be applied in each case. They are intended to define the requirement more precisely rather than to limit the scope of any investigation which may be contemplated in these general areas.

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3. Substantial progress in any of the areas mentioned above could contribute significantly to the ability to develop more effective technical support of intelligence operations and would be most welcome.


C/TSD

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